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MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY
UNITED STATES DEPARTMENT OF AGRICULTURE

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U. S. Department of Agriculture

Number 230

Activities for May
(Not for publication)

June 1933

FRUIT AND SHADE TREE INSECTS

Methyl thiocyanate shows promise against California red scale on citrus.--H. R. Yust and Lillian Baird, Whittier, Calif., report on fumigation (in cooperation with H. C. Cupples and J. Hiley, of the Bureau of Chemistry and Soils) of Chrysomphalus aurantii Mask. under controlled conditions. They state: "The work in May was concerned almost entirely with small-scale fumigation tests with methyl thiocyanate compared with hydrogen cyanide. Small citrus trees planted outdoors were fumigated under a 50-gallon barrel. Four lemons infested with red scale were suspended within the barrel during each test. * * * Methyl thiocyanate was injected into the barrel in the form of a liquid, sprayed by means of a small nasal atomizer, or as a dust, consisting of liquid methyl thiocyanate absorbed in diatomaceous earth in proportion of 1 part liquid to 4 parts of dust by weight, and injected into the barrel by means of a small hand duster. * * * The tests were performed in daylight hours, usually with full sunshine, and with temperatures under the barrel at the time of fumigation ranging from 79° to 105° F. * * * The results are briefly summarized: (1) The variation in degree of injury was apparently due largely to difference in the character of growth of the tree, the more tender growth being most seriously injured; (2) the tests indicate definitely that methyl thiocyanate produced less injury to the trees than did equivalent gram-molecular dosages of hydrogen cyanide; (3) the tests in which the dosage and exposure were varied indicate that it may be possible, by the use of methyl thiocyanate, to obtain a satisfactory kill of scale without injury to the tree."

Reduction of pecan crop demonstrated as caused by black pecan aphid.--G. F. Moznette, Albany, Ga., reporting on pecan trees sprayed last season with nicotine sulphate to prevent premature defoliation by Melanocallis caryaefoliae Davis, states that 23 percent of such sprayed trees bloomed this spring and that of the check trees, only 1.6 percent bloomed. He presents these records as an indication that premature defoliation by the black pecan aphid influences the set of nuts the following spring.

Lubricating oil emulsions containing more than 4 percent of oil cause some injury to pecan.--Howard Baker, Shreveport, La., summarizes the effect of applications of oil sprays on dormant pecan trees in 1932-33 as follows: "(1) Four percent lubricating oil emulsions were practically 100 percent safe, bud opening and development being normal

and no subsequent sign of injury developing, no matter what oil was used or what the condition of the trees or the orchard in which they were growing; (2) 5 percent lubricating oil emulsions caused no serious injury but did retard bud opening and development in some instances, with the result that the foliage on some of these trees was weak and sickly, some trees developing in a normal manner and others dying back to leave dead limbs (mostly small ones); (3) 6 percent lubricating oil emulsions caused some injury to almost every tree, sometimes very little and sometimes serious. The foregoing data substantiate the results of similar tests reported in previous years and bear out the recommendations already made concerning the use of lubricating oil emulsions on pecan trees during the dormant season. They further indicate that the lighter, more volatile oils are somewhat safer than the heavier, less volatile ones but that the added margin of safety is small."

Successful shipment of oriental fruit moth parasites to Japan.---H. W. Allen, Moorestown, N. J., reports that "The first shipment of parasites to Japan was started on May 3, by air express to San Francisco. It consisted of 5,400 adult Glypta rufiscutellaris Cress. obtained from overwintering ragweed borer. Although 2 days were allowed for delays in air transit to the Coast, the consignment encountered unusual transit conditions and missed the boat. It was held over at San Francisco for about a week until the next boat, and, although it arrived in Japan over 20 days (May 25) after leaving Moorestown, we have received a report from G. J. Haeussler that the parasites arrived in very good condition."

Results with chemically treated codling moth bands.---M. A. Yothers, Wenatchee, Wash., reports that "Properly prepared corrugated paper bands killed from 98 to 99.67 percent of all larvae entering them. The addition of aluminum stearate or alpha naphthylamine to beta naphthol and oil apparently did not increase the kill. Oil of 300 seconds Saybolt viscosity showed no advantage over 100-seconds oil in so far as percentage of kill was concerned. Commercially treated crepe paper bands (beta naphthol and oil) caught only from 1/4 to 1/2 as many larvae as were caught in nearby corrugated bands. Commercially treated beta naphthol bands with a 1/4 inch flange at each side of the back were effective in killing 99.5 percent of the larvae entering them, but the presence of the flange showed no advantage whatever and bands having it actually averaged fewer larvae captured than did the bands without the flange. As high as 823 larvae were captured on a single tree. The 174 trees with corrugated-paper bands averaged 221 larvae per tree, although the crop of apples on the trees was so light that the grower gave up caring for the orchard in June."

JAPANESE BEETLE AND ASIATIC BEETLE RESEARCH

Partial 2-year life cycle for Jap beetle indicated in New England.---I. M. Hawley and C. R. Jones, Moorestown, N. J., report that observations on the development of grubs of the Japanese beetle in the spring

of this year in relation to the brood of 1932 and in the fall in relation to the current brood, "indicate that the beetle in this region is showing a tendency to a partial 2-year life cycle, a condition known to occur in the northern part of its range in Japan."

Manufacture of coated lead arsenate to be standardized.---"Since the original formula of lead-oleate-coated lead arsenate was published in 1926, there have been several modifications," reports W. E. Fleming, Moorestown. "As a result there was apparently no agreement between this original formula and the formulae presented by the different manufacturers. Conferences were held with P. A. van der Meulen, formerly of the Bureau, who developed this formula, and with representatives of the manufacturers. Standard specifications for lead-oleate-coated lead arsenate have been drawn up which will permit the manufacture of a suitable product."

TRUCK CROP AND GARDEN INSECTS

Emergence of Mexican bean beetle on Eastern Shore of Maryland.---According to L. W. Brannon, Norfolk, Va., "The results of emergence from the hibernation cage at Allen, Md., to date indicate that beetle survival will be very close to that of last year. The emergence was 25.26 percent on May 24 this year and 26.02 percent on May 24, 1932."

No home life for male earwigs.---"Some rather interesting new facts in regard to earwig oviposition have been obtained from 10 females dug up in the act of attending eggs in March and kept in the laboratory since that time," reports S. E. Crumb, Puyallup, Wash. "As the eggs hatched the progeny of each female were removed and are being reared singly to maturity. Of these 10 females, which are known to have deposited the usual number of eggs, 5 have now deposited a second lot of eggs--a thing we had never expected them to do * * * A female earwig with young was dug up on May 10 and was entered in a salve jar with two males. * * * On May 27 the female was caring for a mass of eggs. On May 29 one of the males was observed in a mangled and dying condition and on June 1 the remaining male was mangled and dead. The female is very solicitous of her eggs and, apparently looking upon the male as a menace to them, slaughters him with her scissorslike forceps if he is not able to escape. Apparently, to save their lives, the males leave the females about the time the eggs are deposited."

Wireworm fails to pupate at constant temperatures.---C. E. Woodworth, Walla Walla, Wash., reports "an unusually interesting series of results * * * in our attempt to get completed life histories (of Limonius canus Lec.) under controlled conditions. It has been noted that at constant temperature (63.5° F.) pupation was not taking place. Larvae of full size and considerable age were pupating only occasionally. Preliminary experiments indicated that variable temperature would probably remedy this condition. Consequently certain larvae were subjected to higher temperatures (81.5° F.) and fair results were obtained. Quite

recently another series of much younger larvae (little over 1 year old) were subjected to a variety of conditions. Surprisingly enough, the ones with the greatest range (15 days at 59° F., 15 days at 63.5° F., and 30 days at 81.5° F.) gave the best results. * * * Very evidently 15 days at 81.5° (alone) is not sufficient time to induce pupation, but 30 days following the slowing of metabolism gives fairly good results. Contrasted with that are other larvae between 2 1/2 and 3 years old with little or no pupation record. Only after the temperature was varied did pupation take place in any numbers. * * * The experiment just about completed indicates that cycles of 2 weeks in length are more desirable than constant temperature, but that constant temperatures are more desirable than short cycles of 2 days' duration."

Note: This record is interesting as confirming, at least for this insect, an opinion I have long held that constant, and theoretically optimum, temperature and humidity may be unfavorable to the development of insects which, through the ages, have constantly been submitted to variations in these conditions.--C. L. M.

Poison baits for mole crickets.--C. F. Stahl and J. P. Vinzant, Sanford, Fla., conducted four feeding tests in May with the changa (Scapteriscus vicinus Scudd.), described as follows: "One, comparing the cottonseed meal-bran, cottonseed meal-egg mash, and cottonseed meal-meat scrap combinations, confirmed results of a preceding similar test in showing the superiority of the cottonseed-bran combination. Bait with water to moisten it again proved superior to the same bait moistened with molasses in water, 1 to 9. Two tests with various bait ingredients used alone gave interesting but somewhat contradictory results, indicating that the crickets were attracted to animal matter less than to vegetable matter. Bran appeared to be as attractive as any of the following ingredients: Cottonseed meal, bran, egg mash (containing milk), meat scrap, and fish meal. The combination, cottonseed meal + bran, was better than any of the single ingredients."

A case of apparent pseudoviviparity in beet leafhopper.--A. C. Cole, Twin Falls, Idaho, states that "While dissecting adult Eutettix tenellus Bak. to determine the extent of internal parasitization, a perfectly formed first-instar beet leafhopper nymph was found within the oviduct of the mother. The chorion was unruptured and distinctly visible. Three normal eggs were also present. The most plausible explanation of this abnormal and premature development is that some fusion or stricture of the oviduct prevented normal egg deposition, in consequence of which development of the egg began and continued while still within the body of the mother, possibly being accelerated under these conditions. The collection of E. tenellus from which the abnormal female was taken represented a series of 25 each of males and females collected by C. F. Henderson and the writer at a point near Hollister, Idaho, in July 1932."

More on consumption of fat content by migrating beet leafhoppers.--R. A. Fulton, Twin Falls, who previously reported on a cooperative study

of the decrease of fat content by beet leafhoppers in migration (Monthly Letter No. 218), now states: "Through the cooperation of W. A. Shands, of the Grand Junction, Colo., laboratory, collections have been taken of dispersing E. tenellus at various points between the extensive breeding areas near Phoenix, Ariz., and the Grand Junction beet-growing district. These collections were submitted to this laboratory for fat determinations. The determinations show a progressive decrease in total fat content roughly proportional to the distance from the breeding area, the results in general being comparable to the findings previously reported for the Utah territory for 1932."

Control for black slugs on tobacco.--J. U. Gilmore, Clarksville, Tenn., reports: "A 5-acre field of tobacco was attacked by black slugs, Limax sp. (?). Our recommendation of 1 part Paris green and 30 parts of lime dusted on the crop at the rate of 4 pounds per acre was very effective in controlling this new pest. This pest has been reported in the Carolinas as attacking plants in the tobacco seed bed but we believe that this is the first instance of serious attack in the field. These slugs were present to the extent of 10 or 12 to the plant in some parts of the field and had not been carried in from the plant bed, which was uninjured. The paris green in the recommendation was for the flea beetles present."

Derris dust effective against imported cabbage worm.--C. F. Stahl, Sanford, Fla., states that "Against Ascia rapae L., rotenone 1.6 percent at 1 to 200 and rotenone 5 percent at 1 to 800 did not appear to be sufficiently toxic, either as a contact or a stomach poison. The use of derris dust (3 percent rotenone), 1 part in 4 parts inert carrier, gave very good kill, even without the addition of pyrethrum powder. This combination having approximately 0.6 percent rotenone gave better results as a contact dust than did a proprietary cube dust supposed to have the same rotenone content. Hellebore dust failed to give a satisfactory kill."

FOREST INSECTS

More on the southern pine beetle.--The outbreak of Dendroctonus frontalis Zimm. in the more northern limit of its range (noted in the March, 1933, Monthly Letter) seems to be increasing in severity, a re-examination in May of 8,000 acres of virgin pines near Fairfax, Va., indicating population of beetles in the bark of these trees nearly 10 times that normally found in such outbreaks, reports R. A. St. George. It is pointed out, however, that such overcrowding of the beetles may result in the destruction of their progeny and thereby check the outbreak. An examination on June 2 indicated that beetles had emerged from the trees that had previously been heavily infested and were establishing similar crowding in the trees subsequently attacked. Unless a natural control comes, as indicated, artificial control will be necessary in order to save the remaining timber in this and similar tracts.

Imported parasite of gipsy moth established at Wilmington, Mass.---R. C. Brown, Melrose Highlands, Mass., reports that Phorocera agilis R. D. has been recovered at Wilmington, indicating "a spread of several miles either from Boxford, Mass., or from colonies liberated in Chelmsford, Mass., in 1929. This tachinid fly is an important parasite of the gipsy moth in Europe and has been liberated in considerable numbers in New England. Whether or not it will become an effective parasite in this region remains to be seen. At present it can only be stated that it is established."

Control of beech scale.---S. F. Potts, Melrose Highlands, states that "100 per cent kill of the beech scale (Cryptococcus fagi Baer) was obtained by vacuum fumigation with hydrocyanic acid gas at dosages as low as 1/8 ounce to 100 cubic feet at temperatures ranging from 45° to 84° F. A commercial mixture of ethylene oxide and carbon dioxide at the rate of 1 pound per 100 cubic feet at 45° F. gave 100 percent kill of the scale. Lower dosages and lower temperatures were not tried."

Trapping elm leaf beetle.---Experiments by R. C. Brown and J. E. R. Holbrook, Melrose Highlands, in trapping Galerucella xanthomelaena Schr. are reported as follows: "This year isolated farm buildings in Woburn, Mass., were selected for our experiments. Two large elms that were heavily infested in 1932 overshadow the barn. On May 4 tanglefooted cellophane traps were placed in the windows at each end of the barn loft. A few beetles were observed on the windows on that date. On May 16 several thousand beetles were already on the tanglefoot traps. On May 25 the traps were removed. A total of 23,951 beetles were caught on the two traps. Very few beetles were observed in the house. It is believed that a high percentage of the adults passed the winter in the loft and it is also thought that a sufficient number may have been caught to materially reduce the infestation. Such a trap is simple in construction, easy to install, and may be an effective control measure, especially where an infestation occurs near isolated buildings."

CEREAL AND FORAGE INSECTS

Many range caterpillar eggs found to be sterile.---J. C. Frankenfeld, Raton, N. Mex., reports that "from 50 to 100 percent of range caterpillar eggs are sterile, varying in different localities in New Mexico. Some entire egg masses are composed of sterile eggs, indicating a lack of mating by the depositing female. In other masses scattering eggs are fertile and contain fully developed embryos on this date (May 24), showing that while mating had occurred it apparently had not been complete. Sterile range caterpillar eggs have a characteristic green tinge, which is unmistakable. These, when freshly deposited, will permit development of Anastatus semiflavidus Gahan, but in older eggs the contents finally solidify, and, while A. semiflavidus females oviposit in them and the parasite eggs hatch, the resulting larvae do not develop. Later on, the contents of these sterile eggs turn to an amber color, and still later to brown, at which stage the eggs are

dried out and very hard. In areas where heavy depositions of eggs occur the percentage of sterility is much less than in areas where eggs are scarce. In the Wagon Mound, N. Mex., area, where collections for artificial rearings of parasites were made in the fall of 1932, about 50 percent sterility occurs. This is also true of the area north of Mills, N. Mex., where an abundance of eggs may be found. But in areas where eggs are only fairly abundant or scarce from 90 to 100 percent of the eggs collected are sterile."

Notes on a little-known parasite of the Hessian fly.--C. C. Hill, Carlisle, Pa., reports on Pleurotropis epigonus Wlk., a parasite introduced from England in 1891 through the efforts of C. V. Riley and F. M. Webster and of Frederick Enock of London, and now found as far south as Wythe County, Va., and as far west as Illinois. Mr. Hill says: "Numerous females of P. epigonus were induced to oviposit repeatedly into Hessian fly larvae. They were only interested in mature or almost mature larvae in their normal position under the leaf sheaths of growing wheat plants. They were uninterested either in Hessian fly eggs or young larvae exposed to view by the removal of the leaf sheath. The parasite is internal, the egg being placed in the body cavity of the host. * * * Former attempts to breed this parasite artificially have always failed."

Listing out corn stubble in fall gives good kill of southwestern corn borer.--J. R. Horton, Wichita, Kans., gives the results of various cultural treatments of corn stubble for the control of hibernating larvae of Diatraea grandiosella Dyar at Tucumcari, N. Mex. He found that "Listing (or plowing up the stubs by using a lister or 'middle buster') gave a gross mortality of 92.3 percent. This was only slightly less than the kill obtained by digging up the stubs by hand and afterward freeing them from soil, which gave 93.7 percent. Plats on which stalks were simply plowed under on October 24 gave only 51 percent gross mortality. The check plat showed 35 percent mortality, which was unusually high and believed to be owing principally to drought.

COTTON INSECTS

More on the cotton flea hopper at Port Lavaca, Tex.--During May K. P. Ewing and R. L. McGarr continued their observations on hatchings of Psallus seriatus Reut., from overwintering eggs, abundance on wild host plants, and migration studies. From the 32 hibernation cages 4,430 nymphs emerged in May, as compared to 37,221 for April, 38,578 for March, and 218 for February. From May 17 to May 29 no hatching occurred, then after several days of rain (6.4 inches' total) 2,467 nymphs emerged on May 30 and 31. Ten of the common weeds and cotton were caged last fall, but 96.9 of the nymphs have hatched from Croton sp. The population on horsemint rapidly increased from 1,161 on April 21 to 5,824 per 100 sweeps on May 16 to 20, when these plants were in full bloom. Then horsemint began to die down and the population decreased to 2,991 hoppers per 100 sweeps by June 1. By the time the

horsemint was maturing the flea hoppers were building up a heavy population on croton. From April 19 to May 19 the population on croton averaged from 122 to 307 insects per 100 sweeps, but increased to 1,816.5 per 100 sweeps by May 31. By May 15 considerable migration to cotton had occurred and an average of 84.3 adults and nymphs per 100 sweeps were taken. Cotton was squaring by this time and considerable damage was being caused in certain fields. Migration was also shown by the catch on the flight screens; an average of 207 adults per screen during May were taken in cotton fields, 43 from screens in ranch country, and 14 from one screen on the bay front. More flea hoppers were taken on the east sides of the screens, facing the prevailing winds, than from the other directions."

INSECTS AFFECTING MAN AND ANIMALS

Flood stage of river leaves mosquito larvae in moss and rotten wood.---Reporting on life history and habits of Aedes mosquitoes, H. H. Stage, Portland, Oreg., says: "In the month (May) several additional samples of moss on trees and bridges, and rotten wood from fallen logs were flooded in the laboratory. A few handfuls of moss taken from near the base of a concrete railroad bridge produced 17 A. vexans larvae when flooded. This part of the bridge is flooded when a river stage of from 16 feet to 18 feet is reached. The moss was growing on the concrete and was not protected by overhanging shelter of any kind. A sample containing approximately 1 square foot of rotten wood surface taken from the top of a fallen log produced 1,070 larvae when flooded in the laboratory. Of these 96 percent were A. vexans; the rest were A. aldrichi. These logs are flooded when a river stage of 16 feet is reached."

Equipment for determination of freezing points of insect tissue.---Wm. Robinson, Washington, D.C., reports: "Our potentiometer and thermocouple set-up has been arranged for use in determining the freezing and undercooling points of insect tissues. A freezing chamber was made of a 1-quart thermos bottle. The low temperature was obtained by cooling gasoline with solid carbon dioxide, or 'dry ice.' The dry ice was made in our laboratory from liquid carbon dioxide in a drum. The ice is easily collected in a cloth bag placed over the opening of the drum. It is much more convenient to get the ice in this way than to purchase it in the solid form, is less expensive, and can be had in any quantity at any time at a few minutes' notice. A freezing temperature of -25° C. was obtained and much lower temperatures may be had if necessary."

Sheep botfly larvae of all stages found in heads of sheep and goats.---O. G. Babcock, Sonora, Tex., reports that "Collections of larvae of Oestrus ovis L. are being made nearly every week. All stages are to be found in the heads of sheep and goats from first undeveloped first instars to mature grubs. Occasionally a dead grown larva is found, always associated with more or less mucus of the sinuses, usually the

temporal and sometimes the frontal and nasal, but very rarely the superior turbinate area. All stages of larval development may be found in a sheep or a goat head at one time."

Fresh liver a favored food of an eye gnat.--R. W. Burgess, Uvalde, Tex., reports: "We have tried several methods of treatment and baiting, as well as the addition of urea, sodium sulphide, and other chemicals to rejuvenate worn-out baits. So far the results indicate that the presence of a good fresh liver bait is the determining factor in trapping Hippelates pusio Loew. * * * Some of the best catches were observed to be in traps that were exceedingly fouled and dirty, and also laden with the webs of the 'black widow' spider Latrodectus mactans Fab."

Oestrid penetrates skin of reindeer.--Reporting on the examination of microtome sections of the skin tissues of reindeer, W. E. Dove, Savannah, Ga., reports: "The evidence shows that Oestrus tarandi L. does not make extensive excursions in the animal, as does Hypoderma in cattle. Twenty-six days after eggs were deposited on the hair of reindeer a larva was found in the subcutaneous tissue near the hair follicle. Since the larvae penetrate, return, and cut holes in the skin within about 2 months' time, only about 1 month was left for this larva to complete its travels. Our demonstrations of the first-stage larva of O. tarandi in the skin of reindeer is the first demonstration of a penetrating stage of an oestrid in the skin of an animal. The demonstration in the skin of reindeer is considered important because it suggests some leads and limitations on treatments for these pests."

STORED PRODUCT INSECTS

Infestation of third-crop figs by Ephestia spp.--Dwight F. Barnes, Fresno, Calif., reports that "On November 8, 1932, a sample was taken of third-crop Black Mission figs, both from the trees and from the ground, and on November 22 a sample was taken from the ground in the same orchard. These were figs which had set later than the main crop and had ripened after the main crop had been harvested. A portion of these samples were held at room temperature in the laboratory throughout the winter, while the balance were stored in an outdoor insectary. The samples were examined May 17. No infestation was found in the sample from the trees. The sample taken from the ground on November 8 showed larvae present at the rate of more than 76,000 per ton, and those taken on November 22 contained larvae at the rate of 24,000 per ton. These observations, together with information from soil sampling and from the malt-sirup bait trap records from this same orchard, indicate that large numbers of eggs were laid on the fruit which matured and dropped after the main harvest. The larvae from these eggs, when full grown, left the fruit in large numbers between November 8 and 22 and entered the ground for hibernation. Thus not only the unharvested first crop but the unharvested third crop of Black Mission figs must be considered as effective in building up the population of Ephestia which attack the main crop of fruit."

Parasites of Ephestia survive under grapevine bark.---On May 18 H.C. Donohoe, Fresno, "examined 8 Thompson vines for overwintering larvae in a vineyard previously examined on February 6. He found larvae present at the rate of 388 per acre, although the previous examination indicated a population of 870 per acre. Several fresh-appearing empty ichneumonid cocoons were found under the bark of each vine, which probably accounts for much of the decrease in population (of over 55 percent of the Ephestia spp. present)."

Monochromatic light trap tested in dried-fruit storage.---Mr. Barnes also describes the testing of "a monochromatic light trap developed by Professor Herms and his associates at the University of California. The trap was installed in the cut-fruit storage of one of the packing plants at Fresno on May 18, and was operated thereafter by members of this laboratory. The trap was operated from 7:30 p.m. to 5 a.m. for 4 nights and for one day, beginning at 8:30 a.m. and continuing until 8 o'clock the following morning. During these tests the trap took 1,241 insects, of which 609 were storage moths and 231 the storage moth parasite Microbracon hebetor Say. The species of storage moths represented in the collection were: Ephestia figulilella Greg., 81.6 percent; Plodia interpunctella Hbn., 14.2 percent; Ephestia elutella Hbn., 2.5 percent; Ephesiodes sp., 1.7 percent. * * * Of the 231 adults of M. hebetor, 137 were taken during the first 4 nights, or at the rate of 34 per night. During the 24-hour period 94 of this species were taken. Apparently the trap took about as many in the dark as in the daylight. A sample of 40 was examined and was found to consist of 38, or 95 percent, females, and 2, or 5 percent, males. A malt-sirup bait trap, operated in the same storage room about 80 feet from the light trap, failed to take any of the storage moths except P. interpunctella and only about one half as many of these as did the light trap for similar periods. The bait trap took no parasites, which was surprising, as past experience has shown the malt-sirup bait to be quite attractive to Microbracon. Evidently the light trap was sufficiently attractive to overcome most of the response which the moths customarily show to malt-sirup baits."

Life history of the cigarette beetle.---W. D. Reed, Richmond, Va., reports that "The records were complete for 12 mated pairs of the spring brood of Lasioderma serricorne Fab. on May 31. A summary of these records for the females is as follows:" Average preoviposition period, 3.3 days; average oviposition period, 12.8 days; average postoviposition period, 5.3 days; and average number of eggs laid per female, 57.

Scent glands of Tribolium spp. possessed only by adults.---"Recently a request came to this division," states Newell E. Good, Silver Spring, Md., "for information regarding the nauseating properties of Tribolium larvae. Adult Tribolium are known to possess scent glands which give off a vile-smelling discharge when the beetle is injured or excited. Examinations of many individuals of all stages showed that the glands are present only in adults and are absent in the larval and

pupal stages. These glands are not associated with sex, since they are possessed by both males and females. Tribolium confusum Duv., T. ferrugineum Fab., Palorus ratzeburgi Wissm., and Gnathocerus cornutus Fab. were examined and the above was found true in all cases. The odor given off by the two species of Tribolium was indistinguishable, but that of Palorus was fainter and slightly different, and that of Gnathocerus differed somewhat from that of either Tribolium or Palorus."

TOXICOLOGY AND PHYSIOLOGY OF INSECTS

Derris excels pyrethrum (in kerosene extracts) against house flies.--F. L. Campbell, Takoma Park, Md., reports results of 13 series of tests by himself and W. N. Sullivan showing that a kerosene extract of a good sample of derris was more effective as a house-fly spray than was a similar kerosene extract of a good sample of pyrethrum. He says: "Because pyrethrum is usually extracted at the rate of 1 pound of flowers per gallon of kerosene, or 12 grams per 100 c c, we used a lower and a higher concentration (5 g and 20 g per 100 c c) in order to bring out the expected superiority of derris." Percentages of dead and "down" (incapacitated) flies at the end of 1, 2, and 3 days are given. "The results are extraordinarily clear cut. * * * If the percentages of dead and 'down' flies are added, we find that from the first day derris exceeded pyrethrum in effectiveness, particularly in the 5-gram samples. If such results are obtainable under practical conditions, less than 1/2 pound of derris per gallon of kerosene would do the work of 1 pound of pyrethrum per gallon. The only advantage of the pyrethrum that we have so far observed is the greater speed of its initial action, though the difference in time to bring down flies is only a matter of a few minutes. Theoretically, mixtures of derris and pyrethrum extracts should combine the advantages of both."

BEE CULTURE

Standard weight for honey corrected.--George E. Marvin, Somerset, Md., reports that "In order to provide information for a revision of the circular, 'United States grades, color standards, and packing requirements for honey,' determinations were made of the weight per gallon of honeys from all parts of the United States. A considerable variation was found in the weight of these honeys but not one had the weight of 12 pounds per gallon, which up to this time has been considered the minimum for a well-ripened honey. In the revised standards for U. S. Grades, therefore, the minimum weight requirement for honey has been placed at 11.75 pounds (11 lbs., 12 oz.) per gallon of 231 cubic inches at 68° F. (20° C.). This new minimum requirement does not represent a lowering of the standards, because undoubtedly most honeys hitherto reported as weighing 12 pounds or over per gallon in all probability were under this mark. * * * Recently a comparative study was made of three methods for determining the density of honey: (1) By weighing; (2) by means of the Brix hydrometer; * * * and (3) by means of the Abbé refractometer. * * * These three methods were tried on 38 commercial

honeys. In comparing the results, the weight calculated by the refractometer method was in every case found to be a little higher than the actual weight by direct weighing, the average difference being 0.035 pound, and that calculated by the Brix dilution method still higher, the average difference being 0.085 pound. To obtain a more nearly accurate weight by these methods, therefore, the result by the refractometer method may be corrected by subtracting 0.035 and the result by the Brix dilution method by subtracting 0.085."